

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

TRANSLATION

PCT

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43bis.1)

To:

Date of mailing (day/month/year)	See form PCT/ISA/210
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Applicant's or agent's file reference P04/009-rm/gs		FOR FURTHER ACTION See paragraph 2 below	
International application No. PCT/EP2005/000712	International filing date (day/month/year) 25.01.2005	Priority date (day/month/year) 05.02.2004	
International Patent Classification (IPC) or both national classification and IPC G01N30/72, G01N27/447			
Applicant MERCK PATENT GMBH			

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☒ Box No. II Priority
- ☒ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☒ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA/EP	Authorized officer
Facsimile No.	Telephone No.

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Box No. I

Basis of this opinion

1. With regard to the language, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.
☐ This opinion has been established on the basis of a translation from the original language into the following language _____, which is the language of a translation furnished for the purposes of international search (under Rule 12.3 and 23.1(b)).
2. With regard to any nucleotide and/or amino acid sequence disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:
 - a. type of material
☐ a sequence listing
☐ table(s) related to the sequence listing
 - b. format of material
☐ in written format
☐ in computer readable form
 - c. time of filing/furnishing
☐ contained in the international application as filed.
☐ filed together with the international application in computer readable form.
☐ furnished subsequently to this Authority for the purposes of search.
3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table(s) relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
4. Additional comments:

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Box No. II

Priority

1. ☐ The following document has not yet been furnished:

☐ copy of the earlier application whose priority has been claimed (Rule 43bis.1 and 66.7(a)).

☐ translation of the earlier application whose priority has been claimed (Rule 43bis.1 and 66.7(b)).

Consequently it has not been possible to consider the validity of the priority claim. This opinion has nevertheless been established on the assumption that the relevant date is the claimed priority date.

2. ☐ This opinion has been established as if no priority had been claimed due to the fact that the priority claim has been found invalid (Rules 43bis.1 and 64.1). Thus for the purposes of this opinion, the international filing date indicated above is considered to be the relevant date.

3. Additional observations, if necessary:

The International Searching Authority has not been able to consider the validity of the priority claim because a copy of the earlier application whose priority has been claimed was not available to the International Searching Authority at the time that the search was conducted (Rule 17.1). This opinion has nevertheless been established on the assumption that the relevant date is the claimed priority date.

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Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non obvious), or to be industrially applicable have not been examined in respect of:

☐ the entire international application

☒ claims Nos. 8-11

because:

☐ the said international application, or the said claims Nos. _____
relate to the following subject matter which does not require an international preliminary examination (*specify*):

☐ the description, claims or drawings (*indicate particular elements below*) or said claims Nos. _____
are so unclear that no meaningful opinion could be formed (*specify*):

☐ the claims, or said claims Nos. _____ are so inadequately supported
by the description that no meaningful opinion could be formed.

☒ no international search report has been established for said claims Nos. 8-11

☐ the nucleotide and/or amino acid sequence listing does not comply with the standard provided for in Annex C of the Administrative Instructions in that:

the written form

☐ has not been furnished

☐ does not comply with the standard

the computer readable form

☐ has not been furnished

☐ does not comply with the standard

☐ the tables related to the nucleotide and/or amino acid sequence listing, if in computer readable form only, do not comply with the technical requirements provided for in Annex C-bis of the Administrative Instructions.

☐ See Supplemental Box for further details.

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Box No. IV

Lack of unity of invention

1. ☒ In response to the invitation (Form PCT/ISA/206) to pay additional fees the applicant has:
- ☐ paid additional fees
- ☐ paid additional fees under protest
- ☒ not paid additional fees
2. ☐ This Authority found that the requirement of unity of invention is not complied with and chose not to invite the applicant to pay additional fees.
3. This Authority considers that the requirement of unity of invention in accordance with Rules 13.1, 13.2 and 13.3 is
- ☐ complied with
- ☒ not complied with for the following reasons:

See supplemental sheet

4. Consequently, this opinion has been established in respect of the following parts of the international application:
- ☐ all parts
- ☒ the parts relating to claims Nos. 1-7

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Box No. V	Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement		
1. Statement			
Novelty (N)	Claims	<u>3-6</u>	YES
	Claims	<u>1, 2, 7</u>	NO
Inventive step (IS)	Claims	<u>-</u>	YES
	Claims	<u>1-7</u>	NO
Industrial applicability (IA)	Claims	<u>1-7</u>	YES
	Claims	<u>-</u>	NO
2. Citations and explanations:			
<p>1 Reference is made to the following documents:</p> <p>D1: US-A-3926271 (PATASHNICK ET AL) 16 December 1975 (1975-12-16)</p> <p>D2: WO 82/01578 A (HUGHES AIRCRAFT CO) 13 May 1982 (1982-05-13)</p> <p>D3: US-A-4 726 822 (CATES ET AL) 23 February 1988 (1988-02-23)</p> <p>2 INDEPENDENT CLAIM 1 AND CLAIM 2</p> <p>The present application does not meet the requirements of PCT Article 33(1), because the subject matter of claim 1 is not novel within the meaning of PCT Article 33(2). Document D1 discloses (the references between parentheses relate to this document):</p> <p>* A capillary (4), which is sheathed at one end (figures 1, 5), the sheathing (20, 82) comprising aluminium foil (column 9, line 19).</p> <p>* Another embodiment discloses a sheathing layer of gold (column 5, lines 42-48).</p> <p>* The end sheathed with metal foil is tapered on the inside and outside (figures 1, 5).</p> <p>The disclosure of D1 contains the features of claims 1,</p>			

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2, 7.

3 DEPENDENT CLAIM 3

In view of D2, the present application does not meet the requirements of PCT Article 33(1), because the subject matter of claim 3 does not involve an inventive step within the meaning of PCT Article 33(3).

D2 discloses (the references between parentheses relate to said document):

- * A capillary (11), which is sheathed (figure 1), the sheathing (12) consisting of a metal or an alloy.
- * Suitable metals are, *inter alia*, aluminium and platinum (page 5, lines 9-18).
- * The metal sheathing may be applied by various coating methods (page 6, line 33 - page 7, line 4).
- * The sheathing comprises a thick metallic layer with properties which correspond to those of solid metals or alloys (page 7, lines 22-24).
- * The sheathing has a layer thickness of 5-200 micrometres, preferably 20-50 micrometres (page 8, lines 15-20).
- * The capillary contains a stationary phase (page 3, lines 25-27), i.e. a sorbent.

The subject matter of claim 3 therefore differs from the known D2 in that the capillary is sheathed with foil.

The problem addressed by the present invention can therefore be considered to be that capillaries without a protective sheath are mechanically sensitive.

The solution proposed in claim 1 of the present application cannot be regarded as inventive (PCT Article

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citations and explanations supporting such statement

33(3)) for the following reasons:

D2 teaches that the sheathing is preferably 20-50 micrometres thick and has the properties of solid metal. For a person skilled in the art wishing to protect a capillary from mechanical damage, it is obvious in view of the teaching of D2 that he could wrap the capillary in aluminium foil (or other metal foils). It would be obvious to improve the attachment of the metal foil by adhesive or a heat treatment (the heat treatment possibly being restricted by the heat tolerance of the sorbent). To produce the sheathing, the present application uses a gold foil 25 micrometres thick, which is fixed on the capillary for example by heat treatment.

Within the general scope defined by claim 1, the difference between the capillary according to D2 and that according to the present application does not appear to have any influence on the technical properties.

4 DEPENDENT CLAIMS 4-7

Dependent claims 4-7 do not contain any features which, in combination with the features of any claim to which they refer, meet the PCT requirements for novelty and inventive step, see documents D1, D2 and the corresponding passages cited in the search report.

A person skilled in the art is familiar with inorganic monolithic sorbents and it is obvious that the sorbents lying inside the capillary have no influence on the application of an outer coating (if the tolerance of the sorbent is a consideration in the possible case of a heat treatment).

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Supplemental Box

In case the space in any of the preceding boxes is not sufficient.

Continuation of: Box IV

The different inventions/groups of inventions are:

1-7

Metal foil-sheathed capillaries with sorbent filling

8-11

Device for coupling capillary separation methods to mass spectrometer with metal foil sheathing of the capillary end

For the following reasons, these inventions/groups are not so linked as to form a single general inventive concept (PCT Rule 13.1):

1. PCT Rule 13.1 requires that the international application relates to one invention or one group of inventions linked by a common inventive concept.

PCT Rule 13.2 provides that the requirement for unity of a group of inventions is only satisfied if there is a technical link between these inventions by means of one or more identical or corresponding special technical features.

"Special technical features" define a contribution which each of the claimed inventions, seen as a whole, provides beyond the prior art.

2. As found during the search, the prior art with respect to the present application is best represented by D1.

D1 = US 3,926,271 (Patashnick)

3. D1 discloses:

Supplemental Box

* A capillary (4), which is sheathed at one end (figures 1, 5), the sheathing (20, 82) comprising aluminium foil (column 9, line 19).

* Another embodiment discloses a sheathing layer of gold (column 5, lines 42-48).

* The end sheathed with metal foil is tapered on the inside and outside (figures 1, 5).

The disclosure of D1 contains the features of claims 1, 2, 7.

Therefore, these claims do not make any contribution to the prior art.

4. Furthermore, each of the aforementioned groups of inventions contains non-obvious technical features which provide a contribution to the prior art (special features as defined by PCT Rule 13.2).

A comparison of D1 with claims 3, 8, 10, 11 shows that the following features are found to make a contribution to the prior art as represented by D1;

- 4.1 * The capillary is filled with sorbent.
4.2 * The capillary is part of a device for coupling capillary separation methods with mass spectrometer analysis equipment.

These technical features are different from one another.

5. These non-obvious technical features give rise to the objective problem to be solved as
5.1 * Capillaries without a protective sheath are mechanically sensitive.
5.2 * Electrospray tips are complicated to produce and have only a short lifetime in the electric field.

Supplemental Box

6. None of the aforementioned groups of inventions share a non-obvious technical feature; therefore, the groups are different from one another.

No two of the aforementioned groups of inventions share an objective problem. The solutions offered by the aforementioned groups of inventions can be carried out alone or in combination with one another.

Consequently, the solutions are independent from one another; therefore, the features of the solutions are not corresponding.

7. It finally follows that the international application relates to different inventions, between which to some extent there is no technical relationship, and that consequently the requirements of PCT Rule 13.2 are not met. Therefore, there is no common inventive concept linking all the inventions, for which reason PCT Rule 13.1 is not met.